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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,354	10/01/2003	Nobuhiro Inoue	243412US3	3815
22850	7590	10/25/2006	EXAMINER	
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				LAZORCIK, JASON L
		ART UNIT		PAPER NUMBER
		1731		

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/674,354	INOUE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jason L. Lazorcik	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 01 October 2003.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-9 and 11 is/are rejected.
- 7) Claim(s) 10 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election with traverse of claims 1-11, drawn to a method of press bending a glass sheet the reply filed on September 1, 2006 is acknowledged. The traversal is on the ground(s) that the restriction requirement has not established an undue search burden upon the Office. This is not found persuasive because as indicated in the restriction requirement, the claimed inventions have attained *separate classification status in the art* and since the apparatus can be utilized in a materially different processes extending the scope of search beyond the original classification. As such, the search and examination of the entire application of both groups would necessitate divergent fields of search therefore constituting an undue burden upon the Office.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Objections***

Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitation set forth in the immediate claim wherein the sheet is used for "production of an automobile window" amounts to a statement of intended use and therefore provides no further limitation to the parent claim 1 drawn to the method of bending a glass sheet.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1-9 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically Claim 1 sets forth the limitation wherein the bending process must proceed according the "bending evaluation index",  $\phi$ , which the applicant defines according to the following relationship:

$$\phi = \int_0^T \frac{P(\tau)}{\eta(\tau)} d\tau$$

The applicant further limits the bending process by indicating that the viscosity as a function of temperature,  $\eta(T)$ , must fall within the range  $10^5$  Pa\*s to  $10^8$  Pa\*s and that the bending evaluation index must fall within the range of 0.05 and 2.00. It is reasonable that one of ordinary skill in the art would reasonably be able to reproduce the requisite viscosity conditions for a given composition of material. It is however **not**

reasonable to assume that one of ordinary skill would reasonably be apprised of the detailed relationship of pressure with respect to time,  $P(\tau)$ .

Specifically, the applicant indicates that "Even if any one of the parameters is a variable, the essence of the principle does not change as long as the calculated value of (f) satisfies the formula 1" (pg 9 lines 17-20). The scope of this disclosure is understood to include any function of applied pressure differential in time would adequately satisfy the inventive relationship. As examples of breadth of this premise, it is understood that a scenario wherein the pressure difference was applied in an extremely short timeframe (e.g. an explosion or a localized impact upon the surface of the glass sheet) would be covered under the scope of the present invention with the assumption that the  $\phi$  and  $\eta(T)$  parameters comply with the disclosed limitations. Similarly, since  $P(\tau)$  is defined as a pressure differential, it is conceivable that said differential could change in sign such as by an oscillatory function and still meet the other restrictions as set forth. With these factors in mind, it is clear that one of ordinary skill in the art at the time of the invention would **NOT** necessarily be equipped with enough detail to utilize the glass bending process as set forth in this application without undue experimentation.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

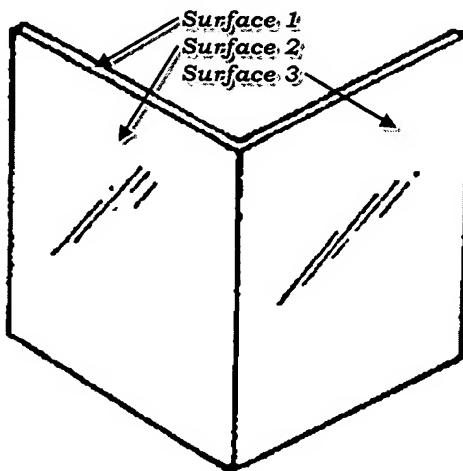
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomozane (US 5,589,248 as cited by Applicant on Form PTO 1449).

Regarding claims 1, 2, and 3 Tomozane teaches a method of bending a glass sheet wherein the sheet is heated to have a viscosity of about  $10^8$  poise. Pressure is applied to cause the bending of the glass sheet over a period of 1 to 5 minutes (column 8, Lines 11-13). The reference indicates that "to bend a heated glass sheet along a bend line at a predetermined angle according to the invention, a glass sheet holding mechanism is used. **A bending speed, a bending force and a final bend angle are precisely controlled by the glass sheet-holding mechanism, so that generation of cracks at the bend area is prevented** and a predetermined shape of the cross section and a predetermined thickness at the bend are attained" (Column 7, Lines 60-67).

The reference also sets forth that "a radius of curvature of the outer circumference of the bend transverse to the bend in the shaped glass sheet thus produced was 5mm, i.e. 1.2 times the thickness of the glass sheet in the straight sections" (column 14, Lines 24-27). The immediate disclosure reads directly upon claim 2 wherein the bent glass sheet includes a portion having a radius of curvature of not

larger than 100mm. Further as clearly depicted in figure 6a, Tomozane teaches a glass sheet which includes a corner where three surfaces connect together and each surface is a flat surface.



**FIG. 6A**

Tomozane does not explicitly indicate the applied force needs to comply with the relationship as set forth in formula 2. It is understood from the applicants specification that controlling the "bending evaluation index" value to the range outlined in claim 1 is performed in order to avoid the formation of a wrinkle in a peripheral edge of the sheet or "the formation of several kinds of optical distortions in the glass sheet" (Specification pg 3, Lines 10-14). Tomozane clearly indicates that the applied force or applied pressure as a function of time is "***precisely controlled***" to preclude the generation of cracks or a kind of "optical distortion" at the bend area. In addition, the Tomozane process is undertaken on glass material heated to a viscosity falling within the claimed range of  $10^5$  to  $10^8$  poise. It would have therefore been obvious to one of ordinary skill

in the art at the time of the invention to control the bending time, viscosity, and applied pressure as a function of time in order to comply with the "bending evaluation index" range as claimed above in order to preclude the formation of optical distortions in a bent sheet of glass.

With respect to claim 7, Tomozane teaches that "the glass sheet is molded on the frame **by gravity** or by other external force to have a bend of a desired angle" (Column 1, Lines 46-48). This disclosure is understood to provide a method wherein the sheet is bent "primarily only by gravity".

With respect to claim 9, Tomozane teaches that "a usual float method glass sheet is used in known glass bending methods (Column 1, Lines 43-44)

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomozane as applied to claim 1 above, and further in view of Anderson (US 4,361,429). Tomozane fails to explicitly indicate the use of a vacuum mold and a ring which perform a trimming operation during the disclosed glass bending process. Anderson teaches a method bending a glass sheet to final utilizing a concave mold (12) and a peripheral trimming device. Anderson teaches that the sheet of molten glass overlying the mold cavity initially conforms to the contour of the mold cavity...with a vacuum applied to the mold cavity" and the (Column 2, lines 14-32). The glass sheet is pressed between this mold cavity and trimming member (34) or "a ring substantially conforming to a peripheral edge of the glass sheet. This trimming member trims a portion of the glass sheet sandwiched between the mold cavity and the member in accord with the limitation set forth in claim 5. It would have been obvious to one of ordinary skill in the art at the

time of the invention to modify the Tomozane process according to the teachings of Anderson to incorporate both a vacuum cavity mold and a trimming member as described. This would have been an obvious modification to anyone seeking to fabricate a complexly bend glass object from a larger sheet of stock glass.

Claim 6 is rendered obvious in light of the rejection of claim 5 under 35 USC 103(a) as set forth above wherein the plunger mold (28) is understood to be functionally equivalent to the claimed "the mold" provided above the glass sheet.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomozane as applied to claim 1 above, and further in view of Hirotsu (US 5,071,461). Tomozane fails to explicitly indicate the implementation of a mold release agent in the process as disclosed. Hirotsu teaches that during a press bending operation for a glass sheet, said sheet may be found to adhere to the mold members thereby decreasing the working life of the apparatus. Hirotsu further instructs that "To eliminate this problem, a layer of a heat resistant mold release agent is formed by printing on the surface of the printed layer of the color frit so that good releasing properties are obtained between the colored zone of the color frit and the heat resistant cloth of the pressing member 31. Boron nitride or carbon may be used for the release agent having good heat resistant properties." (Column 12, lines 55-69) It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to provide a mold release agent as taught by Hirotsu on the surface of the molding members in the Tomozane process as in order to prevent adhesion of the glass sheet to the forming members. This would

have been an obvious modification to anyone seeking to promote the useful operating lifetime of a glass bending mold.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomozane and Anderson as applied to claim 4 above, and further in view of Nikander (US 5,292,355). Tomozane-Anderson teaches that the sheet of molten glass overlying a mold cavity initially conforms to the contour of the mold cavity...with a vacuum applied to the mold cavity" however it fails to explicitly set forth the limitation in the bending process wherein air is first blown to swell the glass sheet in a first direction followed by sucking air to bend the glass sheet in a second direction. Nikander teaches a process wherein heated air is blown to increase the temperature of the edges of a glass sheet with "a particular objective ...to provide a method and apparatus for controlling and regulating the gravitational bending of the entire area of the glass sheet" (Column 1, Line 60-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to blow heated air from the mold cavity as described by Anderson before applying vacuum therefrom in order to insure proper heating of the glass sheet during the bending process. As indicated by Nikander this process would help to control and regulate the bending of the entire glass sheet. Therefore in light of the precise bending operation requirements set forth by Tomozane, it would have been obvious to combine the relevant teachings of both Anderson and Nikander to provide a controlled bending operation.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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ERIC HUG  
PRIMARY EXAMINER

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